Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (original) A method of manufacturing substrates with a vacuum plasma treated surface comprising the steps of

- providing a target with a target surface;
- providing at least one substrate distant from and opposite said target surface having a substrate surface;
- generating in the volume between said target surface and said substrate surface a magnetic field pattern of
  a) a magnetron field pattern forming a closed loop considered in direction towards said sputtering surface and, considered parallel to said sputtering surface, tunnel-like arcing from an outer area of first magnetic pole to an inner area of second magnetic pole, whereby said inner area is confined with respect to said outer area by a closed locus of zero component of magnetic field perpendicular to said target surface;
  b) an unbalanced long-range field pattern which is asymmetrical generated by increasing magnetic flux along said outer area relative to magnetic flux along said inner area, whereby said long-range field reaching the substrate surface has a component of the magnetic field parallel to said substrate surface of at least 0.1 Gauss,

- generating a plasma discharge in said magnetic field pattern;
- plasma treating said substrate surface, thereby
- sweeping said asymmetrically unbalanced field pattern along said substrate surface.

2. (original) The method of claim 1, said target surface being a sputtered surface, said plasma treating being sputter-coating.

3. (original) The method of claim 1, wherein said component of magnetic field parallel to said substrate surface is selected to be between 1 G and 20 G.

4. (original) The method of claim 1, further comprising covering with said tunnel-like magnetron field pattern more than 60 % of said target surface.

5. (original) The method of claim 4, thereby covering with said tunnel-like magnetron field pattern more than 85 % of said target surface.

6. (original) The method of claim 1, further comprising generating said asymmetrically unbalanced field pattern by inhomogeneously increasing magnetic flux density along said outer area relative to substantially homogeneous magnetic flux density along said inner area.

7. (original) The method of claim 6, further comprising disturbing homogeneity of increased magnetic flux density by locally applying a further magnetic field along said outer area.

8. (original) The method of claim 7, further comprising generating said further magnetic field by at least one permanent magnet and/or electro-magnet.

9. (currently amended) The method of claim 1~~one of claims 1 to 8~~, further comprising sweeping said magnetron field pattern and said unbalanced field pattern along said substrate.

10. (currently amended) The method of claim 1~~one of claims 1 to 9~~, further comprising the step of generating said sweeping by circularly moving said unbalanced magnetic field pattern around an axis perpendicular to said target surface.

11. (currently amended) The method of claim 1~~one of claims 1 to 10~~, further comprising the step of generating said sweeping by moving said magnetron and unbalanced field patterns around an axis perpendicularly to said target surface and offset from a geometrical center of said inner area.

12. (currently amended) The method of claim 1~~one of claims 1 to 11~~, further comprising the step of generating said loop of said magnetron field pattern circularly around a loop central axis.

13. (currently amended) The method of claim 1~~one of claims 1 to 12~~, further comprising the step of generating by said asymmetrically unbalanced field pattern an area of maximum plasma density adjacent the periphery of said substrate surface and sweeping said maximum adjacent to and along said periphery.

14. (original) The method of claim 7, further comprising adjusting uniformity of ion current density at said substrate surface by adjusting said further magnetic field.

15. (original) The method of claim 7, further comprising generating said further magnetic field by at least one coil generating a magnetic field substantially parallel to said target surface.

16. (original) The method of claim 15, generating said sweeping comprising supplying said at least one coil with an alternating current.

17. (original) The method of claim 15, further providing more than one of said coils generating respectively magnetic fields in different directions, generating said sweeping comprising applying alternative currents to said coils.

18. (currently amended) The method of claim 1~~one of claims 1 to 17~~, further comprising providing more than one substrate.

19. (original) The method of claim 18, further comprising the step of selecting said substrate to be circular or said more than one substrate to be arranged within a circular area, sweeping said unbalanced field pattern around a center axis of said substrate or area.

20. (currently amended) The method of claim 1~~one of claims 1 to 19~~, further comprising adjusting the current of ions at said substrate surface by adjusting magnetic field component perpendicular to said substrate surface.

21. (currently amended) The method of ~~one of~~ claim 20, comprising the step of guiding electron current in said plasma substantially perpendicular to said target surface towards said substrate surface.

22. (currently amended) The method of claim 1~~one of claims 1 to 21~~, comprising the step of feeding said plasma by a pulsating supply voltage.

23. (original) The method of claim 22, further comprising selecting frequency f of said pulsating to be

$$5\ \text{kHz} \leq f \leq 500\ \text{kHz},$$

preferably to be

$$100\ \text{kHz} \leq f \leq 200\ \text{kHz}.$$

24. (currently amended) The method of claim 22~~one of claims 22 or 23~~, further comprising selecting duty cycle of said pulsating to have 1 % to 99 % off-times (both values included), to have preferably 35 % to 50 % off-times (both limits included).

25. (currently amended) The method of claim 1~~one of claims 1 to 24~~, further comprising establishing in said vacuum chamber a total pressure p to be at most 10^{-1} Pa, preferably

$$10^{-2} \text{ Pa} \leq p \leq 5 \times 10^{-2} \text{ Pa}.$$

26. (currently amended) The method of claim 1~~one of claims 1 to 25~~, further comprising biasing said substrate with an Rf frequency power.

27. (original) The method of claim 26, further comprising adjusting energy of ions bombarding said substrate surface by adjusting said Rf power.

28. (currently amended) The method of claim 1~~one of claims 1 to 27~~, further comprising the step of providing said target with a sputtering surface of one of Ti, Ta, Cu.

29. (original) A magnetron source comprising

- a target with a target surface and an opposite surface;
- a magnet arrangement adjacent said opposite surface and having:
  - at least one first magnet subarrangement;
  - at least one second magnet subarrangement;
  - said first magnet subarrangement having a first area pointing towards said opposite surface and of one magnetic polarity;
  - said second magnet subarrangement having a second area pointing towards said opposite surface and of the other magnetic polarity;

- said second area forming a loop around and distant from said first area;
- said first area generating a first magnetic flux through said target surface;
- said second area generating a second magnetic flux through said sputtering surface;
- said second magnetic flux being larger than said first magnetic flux;
- said second magnetic flux being unevenly distributed along said second area;
- a sweeping arrangement moving at least said unevenly distributed magnetic flux along said sputtering surface.

30. (original) The source of claim 29, wherein said second magnet subarrangement comprises a third magnet subarrangement generating an evenly distributed component of said second magnetic flux and comprising a fourth magnet subarrangement generating said uneven flux distribution.

31. (currently amended) The source of claim 30 ~~or 31~~, wherein said second area loops around a loop central axis, said sweeping arrangement comprising a drive moving said fourth magnet subarrangement around said loop central axis.

32. (currently amended) The source of claim 30~~one of claims 30 or 31~~, said second area looping around a central loop axis, said sweeping arrangement comprising a drive moving said second magnet subarrangement around a rotational axis offset from said loop central axis.

33. (original) The source of claim 32, wherein said central loop axis, said rotational axis and said fourth magnet subarrangement are substantially aligned in radial direction from said rotational axis.

34. (currently amended) The source of claim 29~~one of claims 29 to 33~~, further comprising a magnetic shield movable with respect to said second magnetic flux to generate said second magnetic flux to be unevenly distributed along said second area.

35. (currently amended) The source of claim 29~~one of claims 29 to 34~~, wherein said loop is circular about a loop central axis.

36. (currently amended) A magnetron treatment chamber comprising a magnetron source as claimed in claim 29 ~~one of the claims 29 to 35~~ and a substrate carrier remote from and opposite to the target surface of said magnetron source.

37. (original) The chamber of claim 36, further comprising an anode arrangement adjacent said substrate holder.

38. (original) The chamber of claim 37, further comprising a shield confining a process area between said source and said substrate carrier and being electrically floating or on an anodic potential, preferably on a more negative potential than said anode.

39. (original) The chamber of claim 37, wherein said anode is hidden behind a shield arrangement and with respect to processing volume.

40. (currently amended) The chamber of claim 37~~one of claims 37 to 39~~, further comprising at least one coil with a coil axis perpendicular to the sputtering surface of said source.

41. (currently amended) The chamber of claim 36~~one of claims 36 to 40~~, wherein said substrate carrier is electrically floating or connectable to a predetermined biasing potential.